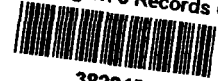


East Alton / Olin Corporation
011902002 - Madison



EAST ALTON, ILLINOIS 62024

EPA Region 5 Records Ctr.



382815

June 14, 1984

RECEIVED

JUN 18 1984

Mr. Dale Helmers
Illinois Environmental Protection Agency
2200 Churchill Road
Springfield, Illinois 62706

E.P.A. - D.E.P.C.
STATE OF ILLINOIS

Dear Mr. Helmers:

The purpose of this letter is to submit, for Illinois EPA Approval, Olin's proposal for Hydrogeologic Investigations and Monitoring Well Installation at Olin's Zone 6 Emergency Holding Lagoon. Specifically, Olin seeks agreement from the Illinois EPA that the proposed scope of work will meet the Agency's requirements for the establishment of a groundwater monitoring system which will comply with Title 35, Illinois Administrative Code, Part 725, Subpart F, Groundwater Monitoring.

Olin's proposed scope of work is outlined in Attachment I which is a report from John Mathes and Associates titled "Study of Scope and Costs For Hydrogeologic Investigations and Monitoring Well Installation - Zone 6, Emergency Overflow Lagoon". As stated in the report, the proposed scope of work was developed in consultation with the Collinsville Regional Office of IEPA and reflects the Agency's requirements as understood by John Mathes and Associates.

Attachment II is a Project Completion Schedule for establishing a groundwater monitoring system and collecting and analyzing the first set of samples. The drilling start date is, of course, dependent on Olin's receipt of a timely response from the Illinois EPA regarding the proposed scope of work and resolution of any changes in scope which may be necessary as a result of the Agency's review.

If you have any questions regarding this submittal, please contact M.F. Redington at (618) 258-3394.

Very truly yours,

A handwritten signature in cursive script that reads "L.W. Maxson".

L.W. Maxson, Director,
Energy & Environmental Services

MFR/tec

cc: Mr. Perry Mann
IEPA - Collinsville

ATTACHMENT I

STUDY OF SCOPE AND COSTS FOR
HYDROGEOLOGIC INVESTIGATIONS AND
MONITORING WELL INSTALLATION
ZONE 6, EMERGENCY OVERFLOW LAGOON

February 28, 1984

JOHN MATHES & ASSOCIATES, INC.
123 Wedgewood Drive
P.O. Box 330
Columbia, IL 62236

RECEIVED

JUN 18 1984

E.P.A. - O.E.P.C.
STATE OF ILLINOIS



STUDY OF SCOPE AND COSTS FOR
HYDROGEOLOGIC INVESTIGATIONS AND
MONITORING WELL INSTALLATION
ZONE 6, EMERGENCY OVERFLOW LAGOON

This report summarizes the results of preliminary engineering studies performed by John Mathes and Associates, Inc. to establish the scope and associated cost of services necessary to establish a groundwater monitoring system for the emergency overflow lagoon located in Zone 6 at the Olin Corporation facility in East Alton, Illinois (Plate 1).

The capability of a groundwater monitoring system is somewhat subjective in nature and depends on the degree and types of detection assurance which are desired. Because the ultimate acceptability of any such system design appears at this time to rest with the Illinois Environmental Protection Agency, the Collinsville Regional Office of IEPA was consulted for their opinions and preferences in system design. The system design presented herein represents our understanding of a system which meets the requirements of both IEPA and John Mathes and Associates, Inc., for Olin's emergency holding lagoon site.

Although current federal and state regulations make direct reference only to the monitoring well system without comment to the performance of hydrogeological studies prior to or concurrent with monitoring well installation, it is our experience that a site specific hydrogeologic investigation must



also be performed to demonstrate to the IEPA that the system is "capable" of immediately detecting a release of contamination, both now and under the reasonable range of variations in the hydrogeologic regime which may occur in the future. For this reason the scope of services presented herein includes such a study.

In order to establish scope and cost estimates for hydrogeologic studies and monitoring well installation it is also necessary to make advance assumptions concerning the subsurface conditions which must be dealt with. To the degree that such assumptions are accurate, estimates of scope and cost for services should also be. Fortunately, some previous subsurface information from the area exists in the form of borings which were made for the construction of the sewage treatment plant facilities. Boring information for the sewage plant in general and the emergency holding lagoon in particular suggest that the stratigraphic sequence of soils at the site is relatively uniform without the existence of stratified impervious layers and perched waters over the major sand aquifer. If this is true, then a simple monitoring system including relatively few monitoring wells should suffice. When these conditions were discussed with the IEPA a tentative program including five borings all converted to monitoring wells was agreed upon as an acceptable initial program of investigation and monitoring. The need for any



additional borings or monitoring wells to further define site hydrogeology would be determined on the basis of what was encountered during the initial program.

As discussed with IEPA, three of the five borings for the monitor wells should be made to a minimum of thirty feet below the invert elevation of the lagoon. The other two should be extended to approximately 5 to 7 feet below the elevation at which groundwater is first encountered. Three of the borings should be sampled on continuous intervals down to the water level and on 2-1/2 foot vertical intervals thereafter. The other two borings should be sampled for their entire depth on 2-1/2 foot vertical intervals.

Present groundwater levels and flow directions beneath the site are unknown. Water levels noted during the 1970 site investigation showed flow toward the southwest and water in the elevation range of 410 to 415 MSL. If water levels have remained unchanged then boring depths in the 30 to 40 foot range would be expected with monitoring wells being approximately this depth. Plate 2 shows potential locations for four of the five monitoring wells selected on the basis of the groundwater flow direction which existed in 1970. In practice, boring locations 3 and 4 will be selected based on water level data from well locations 1 and 2. According to the IEPA, a fifth boring and monitoring well will be required at a location upgradient and further from the



emergency holding lagoon than monitoring wells 1 through 4 to assure greater certainty of its representativeness of background conditions. Plates 3 and 4 show water levels throughout the American Bottoms Area between 1971 and 1977. As shown on the plates, groundwater levels in the general Alton-Wood River area rose in this period. However, little information about conditions beneath this site can be deduced. The regional rise in water levels is believed to have occurred primarily in response to changes in the quantity and distribution of deep well pumping south and west of the site. If similar rises have occurred at the Olin site their monitoring wells and some borings may be somewhat shallower than would be required based on 1970 water levels.

Another major question to be addressed by the hydrogeologic study is the impact of the East Fork of the Wood River on the direction of groundwater flow at the site. If the River serves as both a source of recharge to and discharge from the groundwater, then monitoring well requirements may be more extensive than those planned herein. A correlation of stage hydrograph data from the river to the response of aquifer water levels is required to answer this question with greater certainty although available hydrogeologic information shown on Plates 2 and 3 does not indicate the existence of groundwater flow toward the Wood River.



Based upon the foregoing discussions an initial program of field investigation including 5 borings sampled as discussed and converted to 2 inch diameter monitoring wells is recommended. Each of the wells should be installed through hollow stemmed augers without the use of bentonitic or organic drilling fluids. The wells should be finished using no more than 10 feet of well screen surrounded by a natural or artificial gravel pack as shown in Plate 5. The well screen should be set so as to split the existing water surface with about 1/2 above and 1/2 below the existing water level. Above the screened interval the borehole should be sealed with a minimum 2 foot layer of bentonite pellets followed by a cement-bentonite grout. Locking steel well protectors should then be concreted into place over the monitoring well riser pipe. Both the well screen and the riser should be threaded pvc of schedule 40 gauge. (See Plate 5). In addition to the soil boring and monitoring well program outlined, field work in the form of borehole permeability testing, surveying to establish borehole and well elevations, water level gauging in the Wood River at several points and well development to remove any minor traces of drill water should be performed.

A laboratory testing program including visual classification of samples according to USDA Methods and grain size analysis should be anticipated to assist in identifying site stratigraphy. No Atterberg limits tests, natural moisture



content tests or laboratory permeability tests are anticipated to be necessary based on the granular nature of site soils indicated from earlier borings.

Hydrogeologic investigations and monitoring well installation will require professional services in the following areas for the project.

1. Planning, coordination and supervision of exploration, field and laboratory testing programs outlined previously.
2. Procurement and review of recent publications regarding the hydrogeology of the Alton-Wood River area as well as stage hydrographs for Wood River.
3. Engineering and hydrogeologic evaluation of field and laboratory test data as well as relationships of site water level trends to those of the Wood River and surrounding area.
4. Review of the adequacy of the existing monitoring well network on the basis of these analyses and recommendations of additional monitoring wells or piezometers if shown to be prudent or necessary to demonstrate system capability.
5. Preparation of water level maps, soil profiles, graphical and tubular data summaries and a final report which summarizes the work performed, data



generated and hydrogeological evaluations. The report will also include rationales which support the choice and capabilities of the existing monitoring well system.

6. Post-report meeting with Olin to discuss report findings and conclusions.

We estimate the cost of the services described to be as follows:

1. Monitoring Well Installation -----

Includes soil boring, sampling and monitoring well installation including labor, equipment and materials for 5 monitoring wells finished as shown in Plate 5.

2. Field Services -----

Includes surveying, well development, stream gauging, field permeability testing, well protector placement, transducer-recorder equipment charges, pump and generator rental charges.

3. Laboratory Testing Services -----

Includes laboratory testing and preparation of finished boring logs.

4. Professional Services -----

Includes engineering, hydrogeologic, clerical and drafting services.

Grand Total----

Based upon discussions with the IEPA under the currently proposed program, either four or five of the monitoring wells will have to be sampled for groundwater



chemistry depending on the results of hydrogeologic studies conducted. If the groundwater flow shows the potential for changing toward and then away from the Wood River during its history, then all five monitoring wells will probably have to be sampled and tested and additional wells may be needed. If not, then only four wells, one upgradient and three downgradient may have to be sampled. It was also indicated by the IEPA that the groundwater monitoring requirements under Part B may change from those outlined herein, however no specifics were available from IEPA personnel in Collinsville to delineate the changes which could be required, or when this information will be available. The general feeling, however, was that if anything, the Part B requirements will be the same or more stringent than those required under interim status. Therefore, it would appear that any work performed to install monitoring system similar to the one described will not be wasted.

If additional borings and piezometers above the minimum of five are necessary to delineate the direction of groundwater flow at the site, these may or may not need to be finished as permanent monitoring wells and would probably not have to be soil sampled as they are drilled. Even if only five monitoring wells are needed, it may not be clear at the time of drilling which ones should be finished as monitoring wells. To provide for this possibility, all piezometers should be constructed in soil

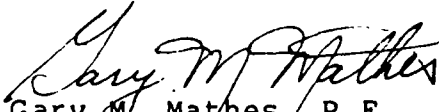


borings drilled similarly with monitoring wells and using threaded PVC pipe and well screen as outlined in Plate 5.

If there are any questions concerning the contents of this report, or if we may be of further service, please do not hesitate to contact me.

Sincerely,

JOHN MATHES & ASSOCIATES, INC.

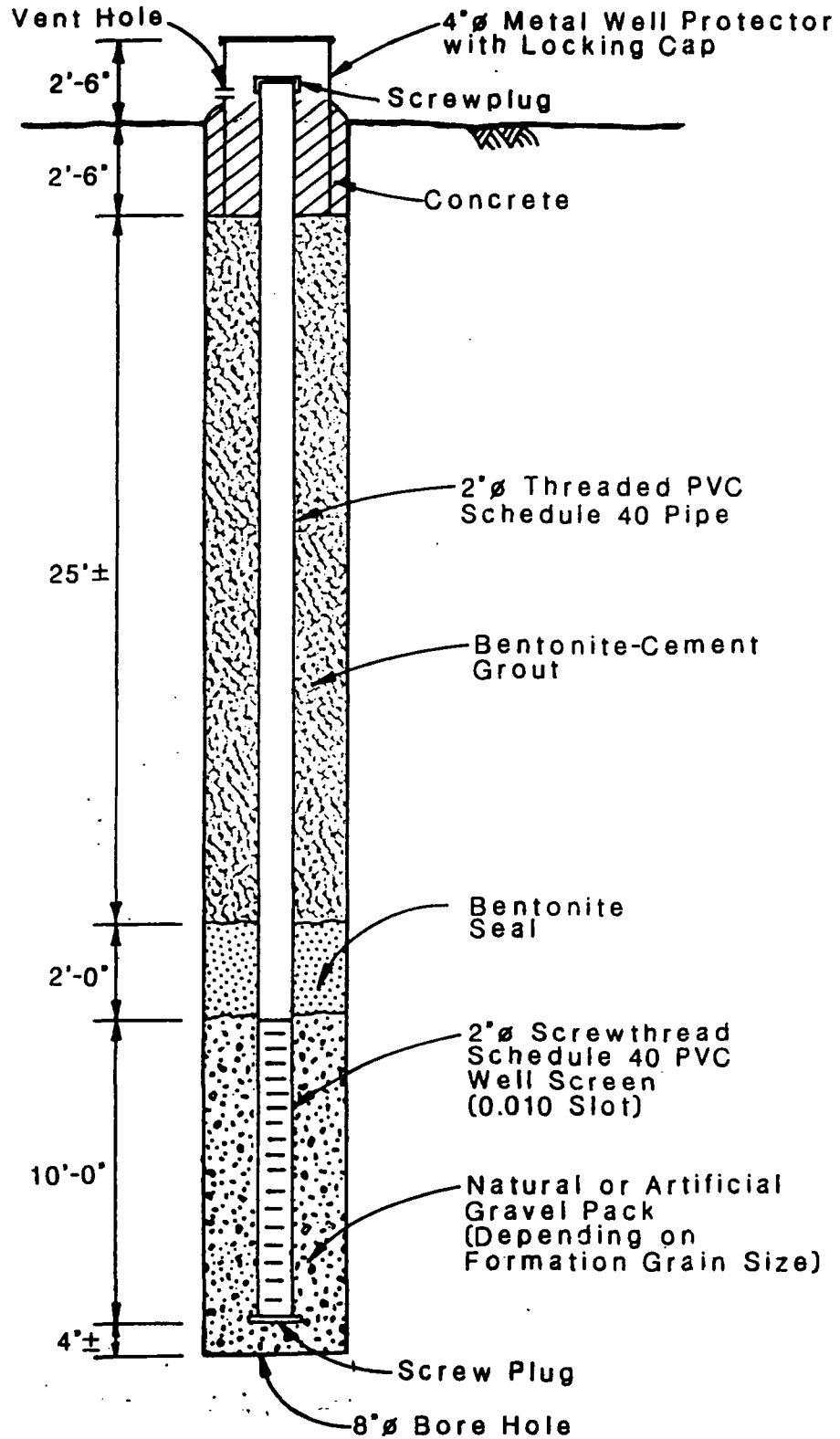

Gary M. Mathes, P.E.
Vice-President and
Director of Engineering

GMM:es/jcs

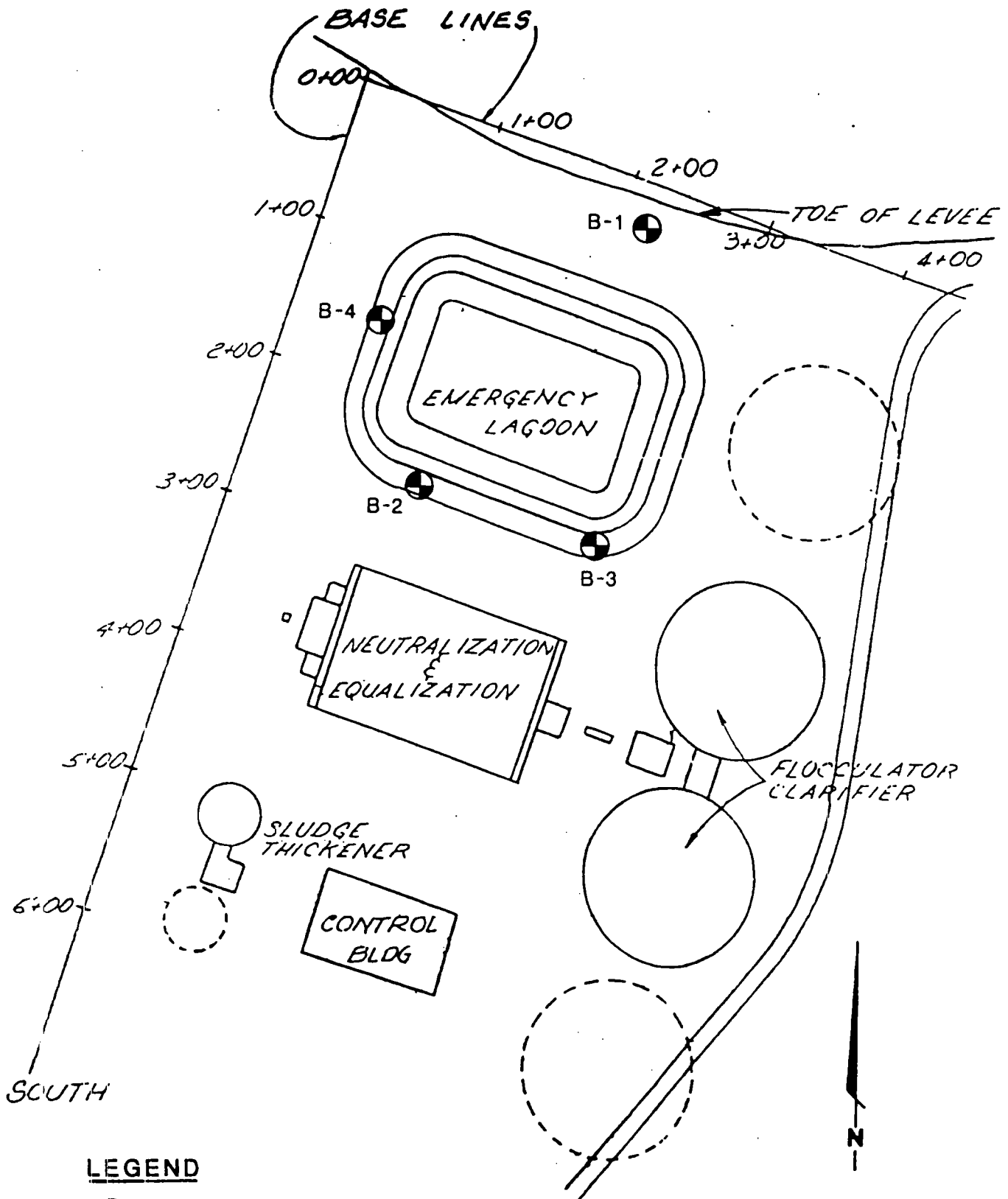




VICINITY MAP



TYPICAL MONITORING
WELL DETAIL



LEGEND

⊕ Possible Monitoring Well Location

0 100 200
Scale, Feet

**BORING AND MONITORING
WELL LOCATION SKETCH**

Attachment II
Project Completion Schedule

Groundwater Monitoring System
For The Zone 6 Emergency Holding Lagoon
Olin Corporation, East Alton, Illinois

<u>Description of Activity</u>	<u>Date</u>
1. Start Drilling in accordance with John Mathes & Assoc. proposal dated 2/28/84.	July 9, 1984
2. Complete Drilling	July 20, 1984
*3. Final Report from Consultant including recommendations for additional wells if necessary.	August 17, 1984
4. Submittal of Consultant's Final Report and sampling plan to IEPA including identification of wells to be sampled, frequency of sampling and parameters to be analyzed.	August 24, 1984
5. Approval of sampling plan by IEPA	September 7, 1984
6. Collect first set of groundwater samples	September 21, 1984
7. Report analytical results of first sampling to IEPA	October 19, 1984
<p>*Note: If Consultant's Final Report contains a recommendation for additional wells to be drilled, the proposal for additional wells will be submitted to the IEPA for review/approval. If this step becomes necessary, it is anticipated that the collection of the first set of groundwater samples will be delayed by 7 to 8 weeks.</p>	